We claim:

1. A method of transmitting local area network (LAN) data in an optical transmission network wherein information is transmitted in frames, each frame containing a first plurality of bytes for transmitting payload data and a second plurality of bytes for transmitting overhead data, the method comprising:

allocating in each frame one or more bytes of the second plurality of bytes for LAN data transmissions;

for each LAN data transmission, transmitting frames with LAN data in the one of more allocated bytes until the LAN data transmission is complete.

2. The method of claim 1 wherein transmitting frames with LAN data in the one of more allocated bytes until the LAN data transmission is complete comprises:

encapsulating LAN data in wide-area network (WAN) frames; and

transmitting frames with the encapsulated LAN data in the one of more allocated bytes until the LAN data transmission is complete.

3. The method of claim 1 adapted for transmitting LAN data between a first and a second network element (NE) in the optical transmission network via an optical link interconnecting the first and second NE.

4. The method of claim 3 wherein a LAN device is connected to the first NE and wherein before transmitting frames with LAN data in the one of more allocated bytes until the LAN data transmission is complete, the method further comprises at the LAN device:

generating the LAN data; and

transmitting the LAN data generated to the first NE.

5. The method of claim 4 wherein before transmitting frames with LAN data in the one of more allocated bytes until the LAN data transmission is complete, the method further comprises at the first NE:

receiving the LAN data transmitted from the LAN device; and

buffering the LAN data received for adapting the rate at which the LAN data is received at the first NE to the rate at which the LAN data received is transmitted to the second NE.

6. The method of claim 5 wherein after transmitting frames with LAN data in the one of more allocated bytes until the LAN data transmission is complete, the method further comprises at the second NE:

receiving the frames transmitted;

extracting the LAN data from each frame received; and

transmitting the LAN data extracted to another LAN device connected to the second NE.

7. The method of claim 1 wherein each frame is an STS-N frame formed of a respective set of multiplexed STS-1 frames.

8. The method of claim 7 wherein in each STS-N frame, the one or more reallocated bytes are F1 bytes from a subset of multiplexed STS-1 frames.

9. The method of claim 8 wherein each STS-N frame is an STS-192 frame.

10. The method of claim 9 wherein the subset of multiplexed STS-1 frames consists of STS-1 frames 1 to 192.

11. The method of claim 9 wherein the subset of multiplexed STS-1 frames consists of STS-1 frames 2-12, 14-24, 26-36.

12. The method of claim 1 wherein the optical transmission network is a synchronous optical network (SONET).

13. The method of claim 1 wherein the optical transmission network is an optical transport network (OTN).

14. The method of claim 6 wherein the LAN data is Ethernet data and wherein the LAN device and the other LAN device are Ethernet devices.

15. The method of claim 14 wherein the LAN device and the other LAN device are respectively located in an Ethernet LAN.

16. An optical transmission network formed of multiple NEs interconnected with optical links where each link has a defined payload transmission capacity allocated for payload data transmissions and a defined overhead transmission capacity allocated for overhead data transmissions of which a portion is reallocated for LAN data transmissions, the optical transmission network comprising at each NE:

a LAN interface connected to receive LAN data for transmission in the reallocated portion of the overhead transmission capacity; and

an optical transmitter connected to the LAN interface and operable to transmit the received LAN data using the reallocated portion of the overhead transmission capacity.

17. The optical transmission network of claim 16 wherein the reallocated portion of the overhead transmission capacity is scalable.

18. The optical transmission network of claim 17 wherein the reallocated portion of the overhead transmission capacity consists of an optical channel.

19. The optical transmission network of claim 17 wherein payload and overhead data is transmitted in frames, each frame containing a first plurality of bytes for transmitting payload data and a second plurality of bytes for transmitting overhead data and wherein the reallocated portion of the overhead transmission capacity consists of one or more bytes of the second plurality of bytes which are reallocated in each frame for LAN data transactions.

20. The optical transmission network of claim 19 wherein at each NE, the LAN interface comprises:

a LAN hub connected to one or more LAN devices to receive LAN data;

a central processing unit (CPU) connected to the LAN hub and operable to process and encapsulate the LAN data received into wide-area network (WAN) frames; and

an overhead interface connected to the CPU and operable to forward the WAN frames to the optical transmitter for transmission in the one or more reallocated bytes.

21. The optical transmission network of claim 19 further comprising at each NE an optical receiver connected to receive LAN data transmitted in the optical transmission network using the one or more reallocated bytes.

22. The optical transmission network of claim 21 wherein the LAN interface is connected to the optical receiver to forward the LAN data received to the one or more LAN devices.

23. The optical transmission network of claim 17 wherein each frame is an STS-N frame formed of a respective set of multiplexed STS-1 frames.

24. The optical transmission network of claim 23 wherein in each STS-N frame, the one or more reallocated bytes are F1 bytes of a subset of multiplexed STS-1 frames.

25. The optical transmission network of claim 24 wherein each STS-N frame is an STS-192 frame.

26. The optical transmission network of claim 25 wherein the subset of multiplexed STS-1 frames consists of STS-1 frames 1 to 192.

27. The optical transmission network of claim 25 wherein the subset of multiplexed STS-1 frames consists of STS-1 frames 2-12, 14-24, 26-36.

28. The optical transmission network of claim 17 is a SONET network.

29. The optical transmission network of claim 17 is an OTN network.

30. The optical transmission network of claim 20 wherein the LAN data is Ethernet data and the one or more LAN devices are Ethernet devices.

31. An apparatus for a first NE in an optical transmission network for transmitting LAN data to a second NE via an optical link interconnecting the first and second NE wherein the optical link has a defined payload transmission capacity allocated for payload data transmissions and a defined overhead transmission capacity allocated for overhead data transmissions of which a portion is reallocated for LAN data transmissions, the apparatus comprising:

a LAN interface connected to receive LAN data for transmission with the reallocated portion of the overhead transmission capacity; and

an optical transmitter connected to the LAN interface and operable to transmit the received LAN data using the reallocated portion of the overhead transmission capacity.

32. The apparatus of claim 27 wherein the reallocated portion of the overhead transmission capacity consists of an optical channel.

33. The apparatus of claim 27 wherein between the first and second NEs, payload and overhead data is transmitted in frames, each frame containing a first plurality of bytes for transmitting payload data and a second plurality of bytes for transmitting overhead data and wherein the reallocated portion of the overhead transmission capacity consists of one or more bytes of the second plurality of bytes which are reallocated in each frame for LAN data transactions.

34. The apparatus of claim 29 wherein the LAN interface comprises:

a LAN hub connected to receive LAN data;

a central processing unit (CPU) connected to the LAN hub and operable to process and encapsulate the LAN data received into wide-area network (WAN) frames; and

an overhead interface connected to the CPU and operable to forward the WAN frames to the optical transmitter for transmission in the one or more reallocated bytes.

35. The apparatus of claim 30 wherein the LAN interface is connected to a LAN device to receive the LAN data.

36. The apparatus of claim 35 wherein the LAN interface further comprises a memory unit connected to the LAN hub and operable to buffer the LAN data received for adapting the rate at which the LAN data is received to the rate at which the LAN data is transmitted in the one or more reallocated bytes.

37. The apparatus of claim 31 further comprising an optical receiver connected to receive LAN data transmitted in frames from the second NE where in each frame, the LAN data was transmitted using the one or more reallocated bytes.

38. The apparatus of claim 37 wherein the LAN interface is connected to the optical receiver and operable to forward the transmitted LAN data to the LAN device.

39. The apparatus of claim 37 wherein the optical transmitter and optical receiver form an optical transceiver.

40. The apparatus of claim 35 wherein the LAN interface is an Ethernet LAN interface, the LAN data is Ethernet data and the LAN device is an Ethernet device.

41. A LAN interface connecting a LAN device to a NE in an optical transmission network of a defined payload transmission capacity allocated for payload data transmissions and a defined overhead transmission capacity allocated for overhead data transmissions of which a portion is reallocated for LAN data transmissions, the LAN interface being operable to receive LAN data from the LAN device and process the LAN data received for transmission using the reallocated portion of the overhead transmission capacity.

42. The LAN interface of claim 41 wherein the reallocated portion of the overhead transmission capacity consists of an optical channel.

43. The LAN interface of claim 41 wherein in the optical transmission network, payload and overhead data is transmitted in frames, each frame containing a first plurality of bytes for transmitting payload data and a second plurality of bytes for transmitting overhead data and wherein the reallocated portion of the overhead transmission capacity consists of one or more bytes of the second plurality of bytes which are reallocated in each frame for LAN data transactions.

44. The LAN interface of claim 43 comprising:

a LAN hub connected to receive LAN data from the LAN device;

a CPU connected to the LAN hub and operable to process and encapsulate the LAN data received into WAN frames;

an overhead interface connected to the CPU and operable to forward the WAN frames to an optical transmitter of the NE for transmission in the one or more reallocated bytes.

45. The LAN interface of claim 44 further comprising a memory unit connected to the LAN hub and operable to buffer the LAN data received for adapting the rate at which the LAN data is received to the rate at which the LAN data is transmitted in the one or more reallocated bytes.

46. The LAN interface of claim 44 wherein the WAN frames are high-level data link control (HDLC) frames.

47. The LAN interface of claim 44 wherein to forward the WAN frames to an optical transmitter of the NE, the overhead interface unit is operable to encapsulate the WAN frames into overhead (OH) frames.

48. The LAN interface of claim 47 wherein the LAN interface is adapted to forward LAN data transmitted to the NE in the one or more reallocated bytes to the LAN device.